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| 09/808,485 | 03/14/2001 | Christopher A. Hazen | Mo-6238/MD00-124 | 3626 |

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| EXAMINER |
|---|
| KUHAR, ANTHONY J |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1754 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

A3-8

| Offic Action Summary | Applicati n N . | Applicant(s) | |
|---|---|---|---|
| | 09/808,485 | HAZEN ET AL. | |
| | Examiner | Art Unit | |
| | Anthony J Kuhar | 1754 | |

-- The MAILING DATE f this communicati n app ars n the cover sh et with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 15, step (b) and step (e) lack antedecent basis in the claims. Examiner suggests adding -the steps of- after "comprising" in line 1. .

In claim 13, "the chlorinated solvents" lacks antecedent basis in the claims.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geiger et al. in view of Imai '868 and further in view of JP 11-033343.

Geiger et al teaches the influence of sulfur on the formation of dioxin/furan during sewage sludge, domestic refuse, and special refuse incineration (page 2, column 1 and 2). Solitary incineration of sewage sludge takes place mainly in fluidized bed ovens. A very small portion of sludge is used together with other combustibles, e.g., in power stations. The temperatures in the fluidized bed oven lie between 650 C and 900 C, depending upon the nature of the sludge. In the hot fluidized layer, the sludge is dried, crushed, and incinerated after igniting. Inert components (ash) are drained out with the waste gas. The energy contained in the waste gas is utilized for preheating the combustion air up to 450 C and/or generating steam. The waste gases are then purified by removing dust, sulfur dioxide, hydrogen chloride, and heavy metal in electrofilters and waste gas rinsing apparatus (page 1, column 2).

Geiger et al also discloses the formation of dioxin/furan during incineration of sewage slude may be because of (a) incomplete destruction of PCDD/PCDF in the combustible, (b)

formation of PCDD/PCDF from the existing chlorinated precursors of those formed in the burning process, such as chlorophenols or chlorobenzoles (page 1, column 3) and the "De-novo synthesis" from inorganic chlorine and organic compounds (page 2, column 1). Geiger et al also discloses that with a sufficiently high sulfur-to-chlorine ratio in the combustible suppression of the de-novo synthesis occurs. Sulfur dioxide released by burning sulfur reacts with the chlorine formed due to the Deacon reaction, thus preventing further chlorination of organic compounds, which is the preliminary step towards the formation of PCDD/PCDF (see page 3, column 2).

Geiger et al does not disclose removing the ash from the gaseous medium, adding an absorbent, and removing acid gases and particulates. However, Imai '868 teaches a composite catalyst for removing dioxin or dioxin precursors after incineration which includes activated carbon (see column 9, line 57 to column 10, line 3). Column 11, lines 8 to 15 teach addition of the composite catalyst to the incinerator exhaust gas between a point subsequent to the combustion chamber and dust collector, at a temperature between 150 and 500 C. Column 11, lines 59-60 teach the flue gases from the incinerator will still contain dioxin or dioxin precursors are retained within the flues. Imai '868 does not teach using the composite catalyst containing activated carbon to absorb the dioxin or dioxin precursors but rather to inhibit the formation of dioxins by injection the carbon before the fly ash collector.

However, JP 11-033343 teaches using a blowing agent that comprises activated carbon for blowing into an incinerator flue gas (see paragraph 10). Paragraph 17 teaches the carbon is used to absorb detrimental organic substances like dioxin. At the time the invention was made, it would have been obvious to one of ordinary skill of the art to use the activated carbon to absorb residual dioxin or dioxin precursors to modify the process of Geiger in view of Imai, e.g. using a

sulfur containing compound to inhibit the formation of dioxins in the incinerator and then using a dust collector to collect the ash) because Imai teaches there will be dioxins and dioxin precursors left in the flue gas even after incineration (see column 11, lines 21-25) and JP 11-033343 teaches a method for absorbing these harmful substances. It would have been obvious to use the product of one process as a reactant in another process if they are similar materials and the "other process" requires the product, e.g. the treatment method of JP 11-033343 requires the dioxin or dioxin precursors left in the flue gas of Geiger in view of Imai. See In re Kamlet 88 USPQ 106 CCPA 1950. JP 11-033343 also teaches the step of removing acid gases by using a sour gas neutralizer (see paragraph 21) which is blown into the gas duct with the activated carbon.

Geiger and JP 11-033343 also does not specifically disclose the rates of adding the sulfur and/or halogenation suppressant or activated carbon, as recited in the instant claims. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rates of adding the sulfur and/or halogenation suppressant or activated carbon, as recited in the instant claims, because Geiger teaches that the sulfur is a results-effective variable for suppressing the formation of dioxin and JP 11-033343 also teaches that the quantity of carbon is a results effective variable based on certain behaviors when too little or too much carbon is added.

Geiger discloses that the energy contained in the waste gas is utilized for preheating the combustion air up to 450 C and/or generating steam but does not specifically disclose that a boiler is used for heat recovery. However it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a boiler for heat recovery from waste gases

from incinerators because Geiger already teaches heat recovery and one of ordinary skill in the art would use a well known technique such as a boiler to do so in view of unexpected results.

JP 11-033343 teaches cooling the exhaust stream to a temperature below of 200 C at the dust collector but does not disclose adding water to the gaseous medium. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a boiler for heat recovery from waste gases from incinerators because JP 11-033343 already teaches cooling the waste gas stream and one of ordinary skill in the art would use a well known cooling technique such as adding water to the waste gas stream to do so in view of unexpected results.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geiger et al. in view of Imai '868 and further in view of JP 05-031323.

Geiger et al teaches the influence of sulfur on the formation of dioxin/furan during sewage sludge, domestic refuse, and special refuse incineration (page 2, column 1 and 2). Solitary incineration of sewage sludge takes place mainly in fluidized bed ovens. A very small portion of sludge is used together with other combustibles, e.g., in power stations. The temperatures in the fluidized bed oven lie between 650 C and 900 C, depending upon the nature of the sludge. In the hot fluidized layer, the sludge is dried, crushed, and incinerated after igniting. Inert components (ash) are drained out with the waste gas. The energy contained in the waste gas is utilized for preheating the combustion air up to 450 C and/or generating steam. The waste gases are then purified by removing dust, sulfur dioxide, hydrogen chloride, and heavy metal in electrofilters and waste gas rinsing apparatus (page 1, column 2).

Geiger et al also discloses the formation of dioxin/furan during incineration of sewage slude may be because of (a) incomplete destruction of PCDD/PCDF in the combustible, (b) formation of PCDD/PCDF from the existing chlorinated precursors of those formed in the burning process, such as chlorophenols or chlorobenzoles (page 1, column 3) and the "De-novo synthesis" from inorganic chlorine and organic compounds (page 2, column 1). Geiger et al also discloses that with a sufficiently high sulfur-to-chlorine ratio in the combustible suppression of the de-novo synthesis occurs. Sulfur dioxide released by burning sulfur reacts with the chlorine formed due to the Deacon reaction, thus preventing further chlorination of organic compounds, which is the preliminary step towards the formation of PCDD/PCDF (see page 3, column 2).

Geiger et al does not disclose removing the ash from the gaseous medium, adding an absorbent, and removing acid gases and particulates. However, Imai '868 teaches a composite catalyst for removing dioxin or dioxin precursors after incineration which includes activated carbon (see column 9, line 57 to column 10, line 3). Column 11, lines 8 to 15 teach addition of the composite catalyst to the incinerator exhaust gas between a point subsequent to the combustion chamber and dust collector, at a temperature between 150 and 500 C. Column 11, lines 59-60 teach the flue gases from the incinerator will still contain dioxin or dioxin precursors are retained within the flues. Imai '868 does not teach using the composite catalyst containing activated carbon to absorb the dioxin or dioxin precursors but rather to inhibit the formation of dioxins by injection the carbon before the fly ash collector.

However, JP 05-031323 teaches spraying powdered activated carbon into an exhaust gas line subsequent to an incinerator (see paragraph 5). Carbon is used to absorb detrimental organic substances like dioxin. Paragraph 6 teaches cooling the exhaust gas to 120 to 200 C before

treatment. At the time the invention was made, it would have been obvious to one of ordinary skill of the art to use the activated carbon to absorb residual dioxin or dioxin precursors to modify the process of Geiger in view of Imai, e.g. using a sulfur containing compound to inhibit the formation of dioxins in the incinerator and then using a dust collector to collect the ash) because Imai teaches there will be dioxins and dioxin precursors left in the flue gas even after incineration (see column 11, lines 21-25) and JP 05-031323 teaches a method for absorbing these harmful substances. It would have been obvious to use the product of one process as a reactant in another process if they are similar materials and the "other process" requires the product, e.g. the treatment method of JP JP 05-031323 requires the dioxin or dioxin precursors left in the flue gas of Geiger in view of Imai. See In re Kamlet 88 USPQ 106 CCPA 1950. JP 05-031323 also teaches acid gases are removed in the process of spraying the activated carbon and a dust catcher is later employed to remove particulates (see paragraph 10).

Geiger and JP 05-031323 also does not specifically disclose the rates of adding the sulfur and/or halogenation suppressant or activated carbon, as recited in the instant claims. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rates of adding the sulfur and/or halogenation suppressant or activated carbon, as recited in the instant claims, because Geiger teaches that the sulfur is a results-effective variable for suppressing the formation of dioxin and JP 05-031323 also teaches in paragraph 8 how much carbon to use in different terms.

Geiger discloses that the energy contained in the waste gas is utilized for preheating the combustion air up to 450 C and/or generating steam but does not specifically disclose that a boiler is used for heat recovery. However it would have been obvious to one of ordinary skill in

the art at the time the invention was made to use a boiler for heat recovery from waste gases from incinerators because Geiger already teaches heat recovery and one of ordinary skill in the art would use a well known technique such as a boiler to do so in view of unexpected results.

JP 05-031323 teaches cooling the exhaust stream to a temperature below of 200 C at the dust collector but does not disclose adding water to the gaseous medium. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a boiler for heat recovery from waste gases from incinerators because JP 05-031323 already teaches cooling the waste gas stream and one of ordinary skill in the art would use a well known cooling technique such as adding water to the waste gas stream to do so in view of unexpected results.

***Conclusion***

Applicant's arguments filed 12/17/02 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J Kuhar whose telephone number is 703-305-7095. The examiner can normally be reached on 8:45 am - 5:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stan Silverman can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-305-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

AK

AK
January 27, 2003

STEVEN BOS
PRIMARY EXAMINER
GROUP 1100